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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,345

04/07/2004

Ping-Lin Kuo

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8124

23552

7590

05/06/2008

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EXAMINER

HAILEY, PATRICIA L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

05/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/820,345

Applicant(s)

KUO ET AL.

Examiner

PATRICIA L. HAILEY

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 28, 2008, has been entered.

As a result of Applicants' request for continued examination, the Amendment after Final Rejection filed on December 31, 2007, previously not entered, has been entered. In said amendment, claims 1 and 5 have been amended; no claims have been canceled or added.

Claims 1-20 remain pending in this application.

Support for the amendments to claims 1 and 5 can be found in the Specification at, for example, page 5, lines 21-23.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. *Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullin (U. S. Patent No. 3,326,827).*

Mullin teaches an epoxide-treated titanium dioxide pigment (col. 1, lines 10-15), said epoxide selected from the group consisting of epoxidized esters of fatty acids and epoxy intermediates, said esters being selected from the group of esterified fatty acids having a chain length of from 1-18 carbon atoms, esterified with alcohols of from 1-10 carbon chain length. See col. 2, lines 33-44 of Mullin, as well as col. 2, lines 10-25, which discloses the formation of epoxy intermediates. This disclosure is considered to

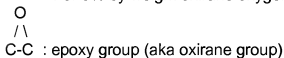
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read upon the "epoxy compound having a general formula" as recited in **claims 1, 5, 9, and 16**.

Application of the epoxide to the TiO_2 pigment may be effected in any one of several ways, such as dissolving the epoxide in a suitable solvent to form a thin epoxide solution, and then either add the pigment to the epoxide solution to form a slurry (or, as an alternative, spray the epoxide solution onto the pigment), after which the treated pigment is dried to volatilize the solvent, followed by dry milling, to insure a uniform coating of the epoxide on the discrete particles of pigment. See col. 3, lines 22-58 of Mullin. This disclosure is considered to read upon **claims 13-15 and 20**.

Epoxides included within those described above will have oxirane oxygens in the range of 2-9% by weight, which corresponds to an epoxy equivalent weight range of 178-800:

For 9% by weight oxirane oxygens:



Number of epoxy groups (and number of oxirane oxygens) = X

$$X(16)/\text{MW} = 0.09$$

$$16X = 0.09\text{MW}$$

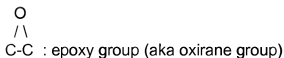
$$X = 0.005625\text{MW}$$

$$\text{EEW} = \text{MW}/X$$

$$\text{EEW} = \text{MW}/0.005625\text{MW}$$

$$\text{EEW} = 178$$

And, for 2% by weight oxirane oxygens:



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Number of epoxy groups (and number of oxirane oxygens) = X

$$X(16)/MW = 0.02$$

$$16X = 0.02MW$$

$$X = 0.00125MW$$

$$EEW = MW/X$$

$$EEW = MW/0.00125MW$$

$$EEW = 800$$

See col. 3, lines 59-66 of Mullin; this disclosure is considered to read upon **claims 2, 6, 10, and 17.**

Exemplary epoxides include alkyl esters (i.e., methyl, ethyl, and acetyl esters) of tall oil fatty acids, polyepoxides, diepoxide polymers, and glycidyl polyethers. See col. 3, line 67 to col. 4, line 4 of Mullin; this disclosure is considered to read upon **claims 3, 4, 7, 8, 11, 12, 18 and 19.**

The epoxide-treated pigments of Mullin have "the unique effect of improving the dispersibility of the pigment...as well as enhancing the color of a polyvinyl resin made therefrom." See col. 4, lines 5-13 of Mullin, as well as col. 5, lines 15-67, which discloses exemplary tests for dispersing the epoxide coated pigments. This disclosure is considered to read upon the claim limitations "pigment dispersion" and "dispersing agent" in **claim 5.**

Mullin does not disclose a numerical temperature at which the "treated pigment is dried to volatilize the solvent", i.e., Applicants' claimed "elevated temperature".

However, Example 1 of Mullin depicts an embodiment in which TiO_2 pigment is added, as an aqueous slurry, to an epoxide solution consisting of polyepoxide linseed oil dissolved in acetone, and the mixture is dried, milled, and micro-pulverized. See col.

4, lines 21-28 of Mullin. In view of this example, and of the reference's teachings regarding drying the treated pigment to volatilize the solvent, one of ordinary skill in the art would reasonably expect that the drying and subsequent volatilization would take place at an "elevated temperature", such as above the solvent's boiling point.

Response to Arguments

In response to Applicants' arguments that Mullin does not suggest the features of "pigment particles reacted with an epoxy compound at an elevated temperature...", the Examiner respectfully submits that Mullin teaches the steps of mixing a pigment with an epoxide and a solvent, and of drying said mixture to volatilize the solvent (considered to read upon "an elevated temperature"), which insures the formation of a uniform coating of the epoxide on the surfaces of the pigment particles (said formation considered equivalent to resulting from "the reaction of pigment particles with the epoxy compound", as recited in Applicants' claims 14 and 15).

Applicants' arguments regarding the "advantageous effect" and the exhibited "lower viscosity value and smaller particle size..., as well as better thermostability and compatibility" obtained by the claimed invention are appreciated, but are not persuasive, as Applicants have not shown any convincing comparative evidence supporting said effect or said exhibited properties. Further, because Mullin discloses process steps comparable to those recited in Applicants' claims, such properties or effects would be expected to be present in the epoxide-treated pigments of Mullin, absent the showing of convincing evidence to the contrary. "Similar processes can reasonably be expected to

yield products which inherently have the same properties." In re Spada, 15 U.S.P.Q. 2d 1655 (Fed. Cir. 1990).

Although Mullin may disclose "TiO₂ particles physically coated a plasticizer for dispersing TiO₂...in the polyvinyl resin for the production of a PVC panel", the reference is relied upon for its teachings regarding the "actual application of the epoxide to the TiO₂ pigment", as disclosed in, for example, col. 3, lines 21-33 of Mullin.

For these reasons, Applicants' arguments are not persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA L. HAILEY whose telephone number is (571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/
Examiner, Art Unit 1793
May 5, 2008